

APHID NOTES FROM UTAH¹BY GEORGE F. KNOWLTON²

PTEROCHLORUS ROSÆ (Cholodkovsky)

This large, brown bark feeder was very abundant upon *Rosa fendleri*, on the Utah Agricultural College campus during the latter part of May and throughout June 1928. Specimens were first collected by Miss Verda Dowdle, on May 28. At this time wingless forms and nymphs were fairly abundant, but no alates were found. Early in June winged forms began appearing and were present in small numbers throughout the month. By the beginning of July, the colonies were becoming scarce, containing few individuals, and soon disappeared entirely.

This aphid is very active and easily disturbed. If an infested twig is disturbed, many of the individuals drop off; others run up or down the stem to get away or to find a hiding place. This bronze aphid was attended by large numbers of the common ant, *Formica rufa*.

Apterous vivipara. Color brown; body and appendages covered with numerous long, curved hairs; size 2.7 to 3 mm. long and about 1.7 mm. wide across the abdomen; rostrum long, reaching abdomen; head somewhat rounded, with a prominent median suture; antennæ about half the length of the body; antennal III, 0.53 to 0.58 mm. long, and armed with 4 to 7 large, oval sensoria; IV, 0.22 mm., with 1 to 3 sensoria; V, 0.21 mm.; VI, 0.15 + 0.03 to 0.16 + 0.35 mm.; legs rather long; cornicles merely raised rings on hairy, broadly cone-shaped black bases; cauda and anal plate black, rounded.

Alate vivipara. Color brown with blackish brown appendages; body and appendages covered with long, curved hairs; rostrum long, reaching abdomen; head somewhat rounded in front, with a prominent median suture; ocular tubercles moderately developed; median ocellus under the vertex of the head; antennæ reaching the abdomen; antennal III, 0.39 to 0.47 mm. long, and armed with 4 to 10 large, oval sensoria; IV, 0.17 to 0.21 mm., with 1 to 3 sensoria; V, 0.22 to 0.25 mm.; VI, 0.13 + 0.03 to 0.15 + 0.45 mm.; legs moderately long and black; wings with normal venation; front wing with radial sector curved and inserted some distance back of the point of the stigma, media indistinct; a dark pigmented patch on the membrane

¹ Contribution from the Department of Entomology, Utah Agricultural Experiment Station. Publication authorized by the director, January 26, 1929.

² The writer wishes to thank O. W. Oestlund, P. W. Mason, M. A. Palmer, and A. C. Maxson for examining certain of the forms discussed in this paper.

back of proximal part of the stigma; cornicles mere rings on broadly conical, black, hairy bases; cauda and anal plate black, rounded.

When placed alive in balsam, on a slide, like most dark aphids, this form discolors the balsam and makes a mount that is unsatisfactory for examination. Most of the specimens of this species, collected by the writer, were killed and stored in 70 per cent alcohol, punctured with a sharp needle, and left to fade out for several days, with one or two changes of alcohol to aid in the clearing process. After the specimens stopped discoloring the alcohol, they were run up through 85 and 95 per cent alcohol for about two hours in each solution. After this, the alcohol was drawn off, the excess moisture taken up with blotting paper, and a quantity of clearing cedar oil poured on. After remaining in cedar oil for about twenty-four hours, the specimens were mounted directly in balsam. This provided good, clear mounts, with practically no breaking of antennæ, legs, or distortion of wings.

Fig. 1. *Pterochlorus rosæ* (Chol.). A, antenna of alate viviparous; B, antenna of apterous viviparous; C, rostrum or beak of apterous; D, front wing of alate; E, head of alate; F, cornicle of apterous.

PERIPHYLLUS NEGUNDINIS (Thomas)

This pale yellowish, hairy aphid is very commonly found in Utah, sometimes causing damage to the box elder, *Acer negundo*, upon the leaves of which it feeds. The tiny, very much depressed dimorphs, with their fan-like setæ are encountered on the leaves during the summer months, apparently making no growth for weeks at a time. The writer has collected this species in Utah from Bountiful, Brigham City, Brigham Canyon, Centerfield, City Creek Canyon, Emigration Canyon, Farmington Canyon, Logan, Logan Canyon, Mona, Newton, Provo, Salina, Salt Lake City, Spanish Fork, and Tremonton. Collections have also been made in Idaho at Clifton, Dayton, Malad, and Preston.

CHAITOPHOROIDES MIDDLETONII (Thomas)

This long-beaked dandelion aphid was collected on one of the Utah Agricultural Experiment Station farms in North Logan, Utah, on September 4 and 7, 1926. The first collection was made by Mr. A. C. Burrill and the writer while they were examining aphid and ant associations in connection with ant behavior and control studies.

This greenish blue to yellowish green aphid was very numerous, feeding on the crown and root of the common dandelion, *Taraxacum officinale*. All of the aphids were under the surface of the ground, and those on the roots extended to a depth of about three inches. Ants, *Formica rufa*, were very abundant, and had formed a sort of thatch of alfalfa straws and grass around the infested dandelions.

This species is interesting because of its subterranean habits, its reticulated and pruinose-covered body, and the possession of numerous long, fine, Chaitophorus-like hairs on the legs and antennæ.

Apterous vivipara. Body greenish blue to yellowish green, grayish pruinose, and covered with reticulations; lateral and dorsal black areas cover part of each body segment; size 1.8 to 2.3 mm. long and 1.25 mm. wide across the abdomen; antennæ 1 mm. long and black, except distal ends of III, IV, and V, which are light; antennal III, 0.22 to 0.27 mm. long and armed with 0 to 14 sensoria (usually 7 to 12) which are more numerous on the distal half of the segment; IV, 0.14 to 0.16 mm., with 1 to 8 sensoria (usually 2 to 7); V, 0.13 to 0.17 mm., with 0 to 3 sensoria in addition to the primary sensorium which is situated well back from the apex of the segment; VI, 0.1 + 0.18 to 0.1 + 0.2 mm., with 0 to 1 secondary sensorium on basal portion of the segment; legs short and covered with a great number of fine sensilla; abdomen with lateral tubercles which are best developed on the first abdominal segment and back of the cornicles; cornicles black, cylindrical with a weak flange, and 0.15 mm. to 0.18 mm. long; cauda black, moderately long, tapering beyond the broad basal portion, and with numerous sensilla; anal plate black, rounded.

Alate vivipara. Color of head, thorax and appendages, blackish to black, abdomen green with lateral patches of black; size 1.5 to 1.8 mm. long; rostrum long, reaching third coxæ; antennæ black except apical ends of III, IV, and V, which are light; antennal III, 0.31 to 0.35 mm. long, and armed with 21 to 32 wide margined sensoria of various sizes, occurring in larger numbers on the distal half of the segment; IV, 0.15 to 0.18 mm., with 8 to 15 sensoria; V, 0.14 to 0.16 mm., with 5 to 8 secondary sensoria in addition to the hair-fringed primary sensorium; VI, 0.1 + 0.18 to 0.11 + 0.21 mm., with 0 to 1 secondary sensorium on basal part of segment; prothorax with well-developed tubercles; wings with normal venation; legs moderately developed and armed with numerous sensilla; abdomen with lateral tubercles which are largest on the first segment and back of the cornicles; cornicles black, 0.15 mm. long, cylindrical and with a weak flange; cauda black, tapering gradually from broader base to rounded apex, and armed with numerous hairs.

Apterous ovipara. Color green, yellowish green or reddish green; body covered with reticulations, grayish pruinose, with fewer black areas than in the apterous viviparous; size 1.75 to 2.2 mm. long and 1.1 mm. wide across the abdomen; rostrum reaching third coxæ; antennæ black, seldom reaching 1 mm. in length, and situated on poorly developed tubercles; antennal III, 0.17 to 0.19 mm. long, and without sensoria; IV, 0.11 to 0.13 mm.; V, 0.11 to 0.13 mm.; VI, 0.1 + 0.16 to 0.1 + 0.19 mm.; prothoracic tubercles well developed; legs short and covered with numerous fine sensilla; abdomen with lateral tubercles, the first and last pairs being largest; cornicles black, cylindrical, with a weak flange, and 0.15 mm. long; cauda slightly shorter and more blunt than in apterous viviparous, and with about 12 to 14 sensilla; anal plate black, rounded.

Eggs 0.52 to 0.55 mm. long and about 0.22 mm. thick.

Alate viviparous, apterous viviparous and apterous oviparous females were all present when the first collection was made in early September, 1926.

This aphid seems to be *Aphis middletonii* Thomas. It has a bushy cauda, hairy legs, and is a root feeder. Instead of having a body of almost a uniform lead gray, it differs from the original description³ in having the head black, and black lateral and dorsal areas on the thorax and abdomen of the apterous viviparous forms. The antennæ are blackish to black, instead of lighter than the body, and the cornicles and cauda are black, instead of lead gray or lighter colored. This is the same species as that collected by H. L. Sweetman⁴ from the roots of dandelion at Ames, Iowa, August 12, 1924, and determined *middletonii* Thomas, by Dr. E. M. Patch. Mr. Sweetman very kindly lent the writer slides of this species, for comparison with the Utah material.

Fig. 2. *Chaitophoroides middletonii* (Thomas). A, antenna of alate viviparous; B, antenna of apterous viviparous; C, antenna of apterous oviparous; D, section of reticulated body surface from side of abdomen of apterous viviparous; E, apterous viviparous; F, cornicle of oviparous; G, cornicle of apterous viviparous; H, cornicle of alate; I, cauda of oviparous; J, cauda of apterous viviparous; K, cauda of alate.

CHAITOPHOROIDES POPULIFOLIÆ (Fitch)

This speckled poplar aphid was present in Smithfield Canyon, Utah, on August 24, 1925. Enormous numbers of both winged

³ Thomas, Cyrus. Eighth Report of the State Entomologist on the Noxious and Beneficial Insects of the State of Illinois, pp. 99-100, 1877.

⁴ Sweetman, H. L. Notes on Insects Inhabiting the Roots of Weeds. Annals of the Ent. Soc. of America, Vol. 21, No. 4, p. 595, 1928.

and wingless females were attacking the apical leaves and tender bark on nearly all branches of infested trees. Both surfaces of the leaves were commonly attacked by this aphid so that handling of the infested parts of the plant stained the hands reddish brown from the body liquids of individuals that became mashed. A large black ant was attending this aphid, and numerous syrphid larvæ were feeding upon it.

Additional collections of this species have been made at Birch Canyon and Big Cottonwood Canyon in Utah, and in Immigration Canyon, Idaho.

Apterous vivipara. Color brownish red with white flocculent patches over parts of the body; size 2.5 to 2.8 mm. long and 1.4 to 1.6 mm. wide across the abdomen; rostrum scarcely reaching third coxæ; head, antennæ and legs armed with numerous long, slender hairs; antennal III, 0.51 to 0.53 mm. long, and armed with 14 to 23 round sensoria; IV, 0.27 to 0.31 mm.; V, 0.21 to 0.25 mm.; VI, 0.11 + 0.45 mm.; prothoracic tubercles present; legs fairly long; abdomen with three pairs of lateral tubercles; cornicles black, 0.6 to 0.7 mm. long, somewhat cylindrical but thicker toward base; cauda black, elongate with constriction near base and armed with numerous hairs; anal plate black, rounded.

Alate vivipara. Head and thorax black, abdomen reddish brown with white areas of waxy secretion; size 2.3 mm. long; rostrum nearly reaching third coxæ; antennæ and legs armed with numerous elongate, thin hairs; antennal III, 0.41 to 0.47 mm. long and armed with 20 to 32 round sensoria; IV, 0.22 to 0.24 mm., with 0 to 3 sensoria; V, 0.21 to 0.23 mm.; VI, 0.1 + 0.37 to 0.1 + 0.4 mm.; prothoracic tubercles well developed; wings large, with normal venation; legs moderately long; abdomen with three pairs of lateral tubercles; cornicles black, 0.36 to 0.5 mm. long, slightly thickened toward the base; cauda black, elongate, and armed with numerous hairs; anal plate black, rounded.

Alate male. Size 1.5 mm. long; rostrum reaching third coxæ; body in general resembles the alate viviparous forms, except in size; antennæ black; antennal III, 0.43 mm. long and armed with 35 to 40 round sensoria; IV, 0.27 mm., with 10 to 17 sensoria; V, 0.21 mm., with 4 to 13 secondary sensoria; VI, 0.1 + 0.36 mm.; prothoracic tubercles well developed; wing venation normal; legs moderately long and slender; cornicles black, 0.21 mm. long; cauda black, elongate, tapering beyond the base, and armed with numerous hairs; anal plate black, broadly rounded.

Described from one male collected in Smithfield Canyon on August 24, 1925. This is early for the sexual forms of most species to occur in Utah.

Fig. 3. *Chaitophoroides populifoliae* (Fitch). A, antenna of apterous viviparous; B, antenna of alate viviparous; C and D, cornicle and antenna of alate male; E, cauda of alate viviparous; F, cauda of apterous viviparous; G, cauda of male; H, cornicle of alate; I, cornicle of apterous viviparous.

***Aphis chrysothamnicola*⁵ infrequens** Knowlton, n. sp.

This greenish black aphid was collected at Trenton, Utah on June 16, 1927, on the leaves of the common sagebrush, *Artemisia tridentata*.

Alate vivipara. Color black with green and black abdomen; size 1.5 mm. long and fairly broad; anterior margin of head rounded, with antennal tubercles undeveloped; antennæ dusky to black and slightly shorter than body; antennal III, 0.3 mm. long and swollen throughout the median half, which carries four round sensoria arranged in a row; IV, 0.24 mm.; V, 0.21 mm.; VI, 0.13 + 0.21 mm., with the filament slightly thicker toward distal end; prothorax with prominent tubercles; wing venation regular, veins dusky with slightly shaded borders; legs fairly short; cornicles black, 0.11 mm. long, larger toward apex, with a well-developed flange; cauda black, upturned, elongate, with a slight constriction near base; anal plate black, rounded.

Aphis infrequens resembles *Aphis hermistonii* Wilson in many respects. It differs from the latter species in having a larger body, slight shading along the wing veins, longer antennal segments, and having antennal III noticeably swollen throughout its middle one-half.

Fig. 4. *Aphis infrequens*. A, antenna; B, wings; C, D, cornicles; E, prothoracic tubercle, of alate viviparous.

APHIS POMI De Geer

This green apple aphid is very common in Utah, and often does considerable damage. The writer has collected this species from Farmington, Garland, Kaneshville, Logan, Mendon, Provo, River Heights, St. George, Salt Lake, Tremonton, and Trenton, in Utah, and from Clifton, Idaho.

ANURAPHIS ROSEUS Baker

This rosy apple aphid was rather abundant at Provo, Utah, on June 13, 1923, and some damage was resulting to the apple leaves. Usually this form is rather rare in Utah orchards.

⁵ Gillette, C. P., and Palmer, M. A. 1929. New Colorado Aphididae. In *Annals Ent. Soc. America*, Vol. 22, No. 1, pp. 5-7. In preparing this paper the species was described as new, but after the manuscript was in the hands of the printer, Prof. Palmer suggested that the species might be only a variety of a form that Dr. Gillette and she then had in the hands of the publisher, which apparently is the case.

ANURAPHIS PERSICÆ-NIGER (Smith)

During the summer of 1924 the writer collected this species on peach trees in Utah from Perry and Provo.

MYZOCALLIS DISCOLOR (Monell)

This smoky-winged aphid occurs rather commonly in Utah, feeding upon the oak, *Quercus gambellii* and *Q. utahensis*. Collections have been made at Bountiful, City Creek Canyon, Devil's Gate (in Weber Canyon), Farmington, Ogden, Parley's Canyon (elevation 7000 feet), Provo, Salt Lake City, Sugar House, and Willard, in Utah.

Alate vivipara. Size 1.2 to 1.83 mm. long; rostrum short, not reaching second coxæ; head triangular to pointed in front, antennæ slender, about as long as the body, pale, except distal ends of III, IV, V, and most of VI, which are dusky, and armed with a few short, bristle-like hairs; antennal III, 0.35 to 0.46 mm. long with 2 to 6 large round or oval sensoria on somewhat thicker basal portion; IV, 0.23 to 0.31 mm.; V, 0.25 mm.; VI, 0.11 + 0.2 to 0.13 + 0.23 mm.; wings with normal venation, and with smoky areas covering part of the membrane and at distal ends of veins of forewing; abdomen yellowish, with dusky areas on sides and dorsum; cornicles dusky to pale, short, truncate 0.06 to 0.07 mm. long; cauda knobbed; anal plate bi-lobed.

Apterous ovipara. Body covered with long capitate hairs; size 1.7 to 2.3 mm. long; rostrum short, barely reaching second coxæ; antennæ armed with a few strong, capitate hairs; antennal III, 0.35 to 0.38 mm. long; IV, 0.24 to 0.27 mm.; V, 0.21 mm.; VI, 0.1 + 0.18 to 0.11 + 0.19 mm.; hind tibia swollen and covered with numerous sensory areas; tip of abdomen very elongate.

Described from specimens collected at Bountiful, Devil's Gate, and Willard in Utah, September 14, 1925.

Alate male. Size 1.3 mm. long; antennæ thicker than that of females; antennal III, 0.5 mm. long, with 24 to 28 large sensoria; IV, 0.33 mm. with 10 to 14 sensoria; V, 0.31 mm. with 5 to 8 secondary sensoria; VI, 0.15 + (? , broken off) with 2 to 4 sensoria on basal portion; wings with dusky areas as in the winged female.

Described from specimen collected at Bountiful, Utah, September 14, 1925.

Fig. 5. *Myzocallis discolor* (Monell). A, antennal III; B, wings; C, cauda; D, cornicle; E, anal plate; F, cornicle; G, hooks on anterior margin of hind wing (much enlarged); H, head, all of alate viviparous; I, head of apterous oviparous.

Amphorophora accidentalis Knowlton, n. sp.

This aphid was collected on the apical growth of sagebrush,

Artemisia tridentata, near Dry Lake, Utah, on August 10, 1927. The dark wing veins are its most conspicuous feature.

Alate vivipara. Size 1.5 mm. long; head with prominent antennal tubercles; rostrum just reaching third coxæ; head and antennæ armed with prominent, apically spear-shaped sensilla about as long as thickness of antennal III; antennæ dusky to base of III and black beyond; antennal III, 0.66 mm. long, and armed with 24 to 37 small, round sensoria; IV, 0.5 mm., with 12 to 15 sensoria; V, 0.42 mm., with 9 or 10 sensoria; VI, 0.09 + 0.53 mm.; wings with venation normal, veins blackish brown, and with very slight dusky shading at margins of veins on front wings; legs long; hind tibia 1.3 mm. long; cornicles light to slightly dusky, 0.27 mm. long, smooth, and with a prominent flange; cauda slightly dusky, elongate, blunt at end, with 4 or 5 lateral hairs on each side; anal plate dusky, broadly rounded.

This species is near *Amphorophora pergandei* Mason, but differs in having shorter cornicles and antennal segments, and considerably fewer sensoria on antennals III and IV. It differs from *A. aridus* in having longer sensilla on head and antennæ, fewer sensoria, and smooth, thicker and shorter cornicles.

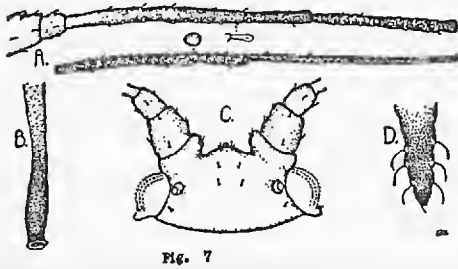
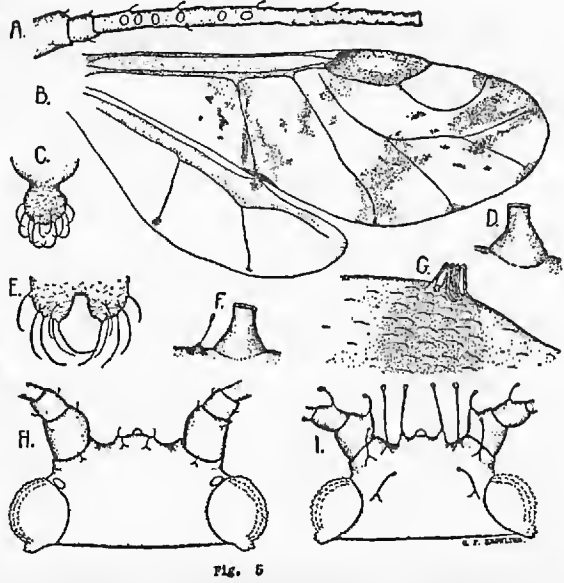
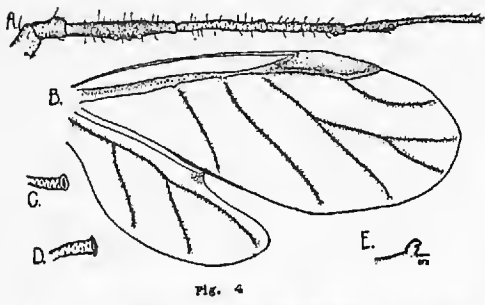
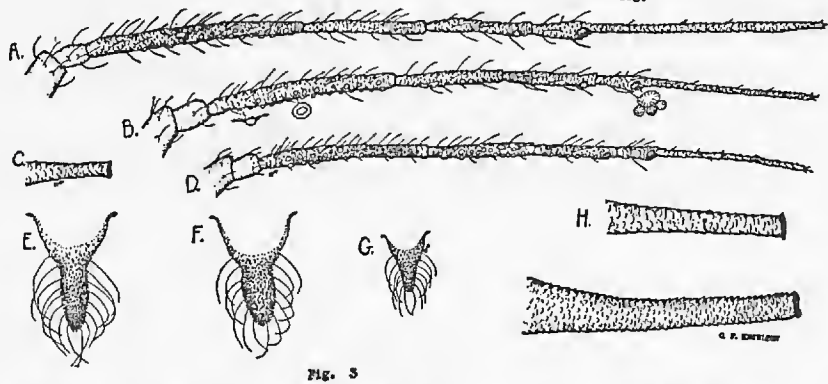
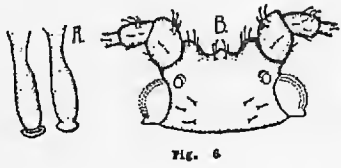
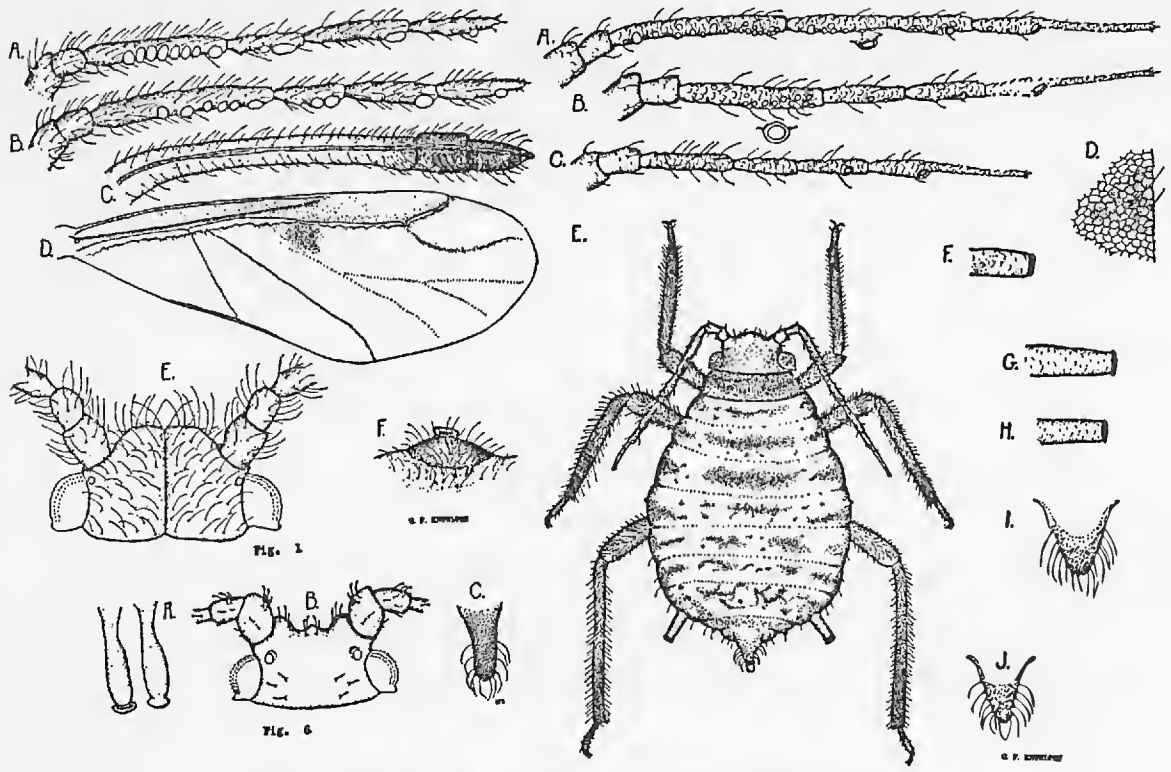
Fig. 6. *Amphorophora accidentalis* n. sp. A, cornicles; B, head; C, cauda, of alate viviparous.

Amphorophora aridus Knowlton, n. sp.

This shiny green aphid was collected from the apical growth of sagebrush, *Artemisia tridentata*, at Amalga, Utah, on May 12, 1928.

Alate vivipara. Size 1.65 mm. long; rostrum scarcely reaching second coxæ; head, prominent antennal tubercles and antennæ armed with a few short, apically enlarged sensilla; antennæ longer than the body and black beyond basal portion of III; antennal III, 0.6 mm. long and armed with 17 round sensoria in a fairly regular row; IV, 0.36 mm. with 2 or 3 sensoria; V, 0.35 mm.; VI, 0.12 + 0.5 mm.; lateral tubercles lacking; wings large, venation normal, veins slender and blackish brown; legs long; hind tibia 1.3 mm. long, with tarsus 0.1 mm. long; cornicles lighter on basal portion, black beyond, 0.43 mm. long, surface imbricated, and with two or three rows of closed reticulations before the flange; cauda green to slightly dusky, long, with three hairs on each side and two on dorsal surface near distal end; anal plate dusky, rounded.

This species differs from *Amphorophora brittenii* Theobald in having fewer sensoria on antennals III and IV and with cornicles much less inflated. It differs from *A. reticulata* Mason in having a longer cauda compared with length of cornicles, and less reticulated areas on cornicles, and from *A. spiræcola* Patch in having sensoria on antennal IV.



The type slides are retained in the collection of the writer.

Fig. 7. *Amphorophora aridus* n. sp. A, antenna; B, cornicle; C, head; D, cauda, of alate viviparous.

ACYRTOSIPHON PISI (Kaltenbach)

This green pea aphid was very abundant in Utah during the summer of 1928 and did considerable damage to alfalfa in the seed-growing areas of Millard County. Slight damage to field and garden peas in northern Utah was also noted.

WORK OF THE PACIFIC OAK TWIG GIRDLER CONSPICUOUS IN THE YOSEMITE VALLEY

Many of the California black oaks (*Quercus kelloggii* New.) in the Yosemite Valley during August, 1929, were spotted thickly with small patches of yellowing leaves. Examinations indicated that this is the work of the Pacific oak twig girdler, *Agrilus angelicus* Horn. In practically all cases the flat oval scale-like shiny black egg was found on the bark near the tip of last year's growth, and the small white borer was found in a spiral mine beneath the bark of the twig. Apparently the beetles which produced the present infestation came from the canyon live oak, *Quercus chrysolepis* Lieb. So far as known, the insects which attack the black oak do not complete their development, but die before the end of the first year. Those that attack the live oak do complete their development and furnish the beetles which carry on the species.—H. E. Burke.

NOTE ON NOTOXUS

While classifying the species of *Notoxus* in the collection of the California Academy of Sciences it was noted that the illustrations given in the *Biologia Centrali Americana* (Coleoptera, Vol. IV, Pt. 2, Tab. 9, Figs. 21 and 21a) of *calcaratus* Horn do not agree with the description of that species. In *calcaratus* the horn is coarsely serrate and the crest carinate; this is not so in figs. 21 and 21a. Fig. 20a, of *Notoxus hirsutus* Champ., agrees with Horn's description of *calcaratus*. Evidently a mistake has been made, either in drawing or in the position of the figure.—Frank E. Blaisdell, Sr.